Space Weather Forecast

Issued on Tuesday, 14 June 2022 at 13:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares. Slight chance of G1/Minor Storms Day 1 and 3 (14 & 16 June), chance of G1/Minor Storm and slight chance of G2/Moderate storm day 2 (15 June).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low in the last 24 hours, with several Common-class flares. There are seven sunspot regions on the visible disc, the largest and most complex of which is AR3031 in the south centre disk. A large CME was observed in association with a Moderate flare early 13th. While the bulk of the ejecta is expected to miss the Earth, the results suggest a possible glancing blow in the early hours of the 15th.

Solar Wind / Geomagnetic Activity: The solar wind speed varied between slightly elevated and elevated. The Total Interplanetary magnetic field strength was mostly moderate but on a slight declining trend . The north-south component, Bz, varied between weakly positive and weakly negative. Geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms detected.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low with a chance of isolated Moderate activity.

Solar Wind / Geomagnetic Activity: A large CME was observed leaving the sun in the early hours of the 13th, in association with a long duration Moderate class flare. Its analysis revealed that while the bulk of the ejecta is expected to miss behind Earth's orbit, there is chance of a glancing blow early on the 15th +/- 9 hours. Solar wind speeds are expected to remain at slightly elevated to elevated levels on Day 1, under the waning influence of a coronal hole. They should then become elevated or perhaps strong either late on Day 1, but more likely Days 2 and 3 (15th and 16th) under the influence of the CME, followed by the high speed stream originating from two coronal holes. Solar winds slowly easing on Day 4. Geomagnetic activity is expected to be mainly Quiet on Day 1 with a slight chance of G1/Minor Storm intervals at the very end of the day. G1/Minor Storm intervals are then more probable on day 2 (15th) with a slight chance of G2/Moderate Storm intervals. Day 3 (16th) will likley become Quiet to Active with a slight chance of G1/Minor Storm intervals due to the lasting effects of the CME and coronal holes. Day 4 is expected to become mostly Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	50	20	5
Strong	G3	No	1	2	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	35	40	40
Very Active	R3 to R5 X	No	2	2	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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